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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
LOKE, STEVEN HO YIN	
ART UNIT	**PAPER NUMBER**
2811	

DATE MAILED: 05/04/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/776,375	ENOMOTO, YOSHIYUKI	
	Examiner	Art Unit	
	Steven Loke	2811	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 February 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *1,4-6,8 and 9* is/are allowed.

6)☒ Claim(s) *2,3,7 and 10-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

1. Claims 17-19 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The specification (page 21, lines 15-16) discloses the diameter of the dummy hole [109] is 0.2 μm. The specification never discloses the diameter of said dummy hole is greater than 0.2 μm as claimed in claim 17.

The specification (page 28, lines 2-3) discloses the diameter of the dummy hole [203] is 0.12 μm. The specification never discloses the diameter of said dummy hole is less than 0.12 μm as claimed in claim 18.

The specification (page 38, lines 1-2) discloses the diameter of the dummy hole [309] is 0.12 μm. The specification never discloses the diameter of said dummy hole is less than 0.12 μm as claimed in claim 19.

2. Claims 2, 3, 7, 10-13 and 15-18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 2, lines 3-4, the phrase "said diameter of said dummy hole is substantially larger than said contact hole" is unclear whether it is being referred to "said diameter of said dummy hole is substantially larger than that of said contact hole".

Claim 3, lines 3-4, the phrase "said diameter of said dummy hole is substantially smaller than said contact hole" is unclear whether it is being referred to "said diameter of said dummy hole is substantially smaller than that of said contact hole".

Claim 10, lines 5-7, the phrase "a dummy hole formed over said first buried wiring in the vicinity of said contact hole and having a hole diameter larger than said contact hole" is unclear whether it is being referred to "a dummy hole formed over said first buried wiring in the vicinity of said contact hole and having a hole diameter larger than that of said contact hole".

Claim 11, lines 5-7, the phrase "a dummy hole formed below said first buried wiring in the vicinity of said contact hole and having a hole diameter smaller than said contact hole" is unclear whether it is being referred to "a dummy hole formed below said first buried wiring in the vicinity of said contact hole and having a hole diameter smaller than that of said contact hole"; line 10, the phrase "———forming...." is not understood.

Claim 12, lines 5-7, the phrase "a dummy hole formed below said first buried wiring in the vicinity of said contact hole and having a hole diameter smaller than said contact hole" is unclear whether it is being referred to "a dummy hole formed below said first buried wiring in the vicinity of said contact hole and having a hole diameter smaller than that of said contact hole".

Claim 12, lines 12-13, the phrase "forming said first buried wiring in such a condition as to be electrically connected with said contact hole and said dummy hole" is unclear as to how the first buried wiring electrically connected with said contact hole and said dummy hole. It is believed that the phrase should rewrite as "forming said first buried

wiring in such a condition as to be electrically connected with the wiring material in each of said contact hole and said dummy hole".

Claim 13, lines 5-7, the phrase "a dummy hole formed over said first buried wiring in the vicinity of said contact hole and having a hole diameter smaller than said contact hole" is unclear whether it is being referred to "a dummy hole formed over said first buried wiring in the vicinity of said contact hole and having a hole diameter smaller than that of said contact hole"; line 9, the phrase "a dummy hole" is unclear whether it is being referred to the dummy hole in line 5 of claim 13.

Claim 13, lines 12-14, the phrase "forming said second buried wiring in such a condition as to be electrically connected with said contact hole and said dummy pattern" is unclear as to how the second buried wiring electrically connected with said contact hole and said dummy pattern. In addition, it is unclear where the dummy pattern being located. It is believed that the phrase should rewrite as "forming said second buried wiring in such a condition as to be electrically connected with the wiring material in each of said contact hole and said dummy hole".

Claim 15, lines 1-2, the phrase "said dummy hole is formed within a distance of said contact hole" is unclear as to how to measure the distance between the dummy hole and the contact hole. Is the distance measured between the centers of the contact hole and the dummy hole?

Claim 16, lines 1-2, the phrase "said dummy hole is formed within 1 μm of said contact hole" is unclear as to how to measure the distance between the dummy hole

and the contact hole. Is the distance measured between the centers of the contact hole and the dummy hole?

3. Claim 13 is objected to because of the following informalities: lines 13-14, the phrase "said dummy pattern" has no antecedent basis. Appropriate correction is required.

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claim 14 is rejected under 35 U.S.C. 102(b) as being clearly anticipated by Yang et al.

In regards to claim 14, Yang et al. show all the elements of the claimed invention in fig. 12. It is a semiconductor device, comprising: a first buried wiring [64]; a second buried wiring ([54] formed under the via [70]) formed as a layer different from said first buried wiring; a contact hole (the hole occupied by the via [70] above the middle portion of the layer [54] (fig. 11 shows the metal layer is [54], not [56], formed under the via [70])) formed between said first buried wiring [64] and said second buried wiring [54] and is filled with a wiring material [70] for electrically connecting said first buried wiring and said second buried wiring therethrough; and a dummy hole (the hole occupied by the via [72]) formed in proximity to said contact hole and to have a hole diameter substantially different from that of said contact hole so that a surface of said first buried wiring (the planar cross-section of layer [64] which is co-planar to the top surface of

layer [58]) is exposed to said dummy hole, the dummy hole being at least filled with said wiring material [72] therein.

It is inherent that the dummy hole is operatively configured to inhibit a void from being generated in said contact hole when said first buried wiring is under stress because the large dummy hole absorbs all the stress from the first buried layer. Therefore, the stress to the contact hole is small and a void would not generated in the contact hole.

6. Applicant's arguments filed 2/13/06 have been fully considered but they are not persuasive.

It is urged, in page 15 of the remarks, that Yang fails to disclose or suggest the limitation of "a dummy hole formed in proximity to said contact hole and to have a hole diameter substantially different from that of said contact hole so that a surface of said first buried wiring is exposed to said dummy hole...". However, fig. 12 of Yang et al. clearly discloses a dummy hole (the hole occupied by the via [72]) formed in proximity to said contact hole (the hole occupied by the via [70] above the middle portion of the layer [54]) and to have a hole diameter substantially different from that of said contact hole so that a surface of said first buried wiring (the planar cross-section of layer [64] which is co-planar to the top surface of layer [58]) is exposed to said dummy hole.

It is urged, in page 16 of the remarks, that the dummy via 72 would not be adapted to form a void in association with the first buried wiring because the dummy via 72 as shown in Fig. 12 of Yang is formed under the conductive line 64 and over a dielectric layer 56 so no void would ever be formed (due to etching of the dummy hole 72)

between the conductive line 64 and the dummy via 72. It is true that there is no void would ever be formed between the conductive line 64 and the dummy via 72. However, the stress of the first buried wiring would be on the dielectric layer [56] through the dummy via [72]. The claim never discloses there would be a void adjacent to the dummy via. Yang et al. clearly discloses there is no void being formed in the contact hole because the dummy hole inherently helps to reduce the stress from the first buried wiring. It is believed that Yang et al. still meet the limitation of the claimed invention in claim 14.

7. Claims 1, 4-6, 8 and 9 are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven Loke whose telephone number is (571) 272-1657. The examiner can normally be reached on 8:00 am to 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lee can be reached on (571) 272-1732. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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April 29, 2006

Steven Loke
Primary Examiner
Steven Loke